MARSILEA MINUTA (MARSILEACEAE): NEW TO FLORIDA AND NORTH AMERICA

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ABSTRACT

Marsilea minuta L. (Marsileaceae), discovered in a streetside ditch in Escambia County, Florida, is here reported as newly introduced for Florida and North America. A probable explanation of its introduction via waterfowl and its potential as a weed are considered.

ABSTRACT

Se cita *Marsilea minuta* L. (Marsileaceae), descubierta en una cuneta del borde de la carretera en el Condado de Escambia, Florida, como reciente neófito para Florida y Norte América. Se discute una explicación probable de su introducción mediante las corrientes de agua y su potencial como mala hierba.

An obviously spontaneous population of the primarily tropical water-clover fern *Marsilea minuta* L. has been found growing in a streetside ditch at the northwest corner of Lownde Avenue and Grundy Street in a residential subdivision on the southwest side of the Pensacola area in Escambia County, Florida. At the time of discovery it was realized that the nearest documented sites for *Marsilea* in Florida were many kilometers to the east and south in the peninsula (Ward and Hall 1976; Johnson 1986) and in Apalachicola (Anderson 1986) for the species *M. vestita* Hook. & Grev. and westward in Mobile, Alabama, for *M. macropoda* Engelm. ex A. Braun in Kunze (Burkhalter 1989). It was also realized that *Marsilea* in the Pensacola area constituted a new county record and a new species of vascular plant for the entire western Florida panhandle (Clewell 1980; Wilhelm 1984). Only the genus of the water-clover fern, namely *Marsilea*—a taxonomically difficult group—was recognized at the time of discovery, so a sporocarp-bearing specimen (*Burkhalter 13220*) collected 3 May 1992 was sent to David M. Johnson of Ohio Wesleyan University for determination. Dr. Johnson identified it as *Marsilea minuta* L. (Johnson 1986). Duplicates of that specimen were deposited at UWFP (Fig. 1). Additional fertile specimens (*Burkhalter 13304*) collected at the discovery site 19 June 1992 were subsequently deposited at UWFP, FSU, FLAS, USF, and NY. According to the information provided by Dr. Johnson (pers. comm. 27 August 1992)

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Marsilea minuta is hereby reported as new to Florida and North America (also see Flora N. Amer. Ed. Comm. 1993, p. 333).

At the discovery site *M. minuta* is the dominant vascular species in the described 60-cm-deep ditch for a distance of approximately 30 m northward from the stated intersection. Associated species in this section of the ditch include *Hypericum mutilum, Ludwigia decurrens, Hydrocotyle umbellata, Mikania scandens, Lipocarpha maculata, Juncus elliottii, Paspalum urvillei, Panicum repens, Sacciolepis striata, Thelypteris palustris,* and *Osmunda regalis.* The substrate is composed of black muddy silt mixed with tan sand, and standing or running water is almost constantly present. To the south of the intersection the ditch is very shallow and grades into adjacent residential lawns. There only a few scattered individuals of *M. minuta* occur over a distance of approximately 20 m in association with *Lilaeopsis attenuata, Cardamine pensylvanica*, and lawn grasses. This section of the ditch is subjected to periodic mowing. Less than 250 m southward the ditch drains into Bayou Grande, a large lagoonlike extension off the western side of Pensacola Bay. A detailed search of all ditches and other low moist habitats in the general geographic area has revealed that *M. minuta* occurs only in the ditch where it was discovered. An interview with Andrew L. Lucas, who resides across the street from the *Marsilea*-containing ditch, has provided information which leads me to conclude that the *M. minuta* colony is not very old and perhaps became established less than five years prior to its discovery.

Marsilea minuta is primarily tropical in its eastern hemisphere distribution (Johnson 1986). There it occurs as a common and widespread weed in Africa and India. In the western hemisphere, where it is introduced, it has heretofore been known only from the islands of Trinidad and Tobago and from the state of Pernambuco in eastern Brazil (Mickel 1985; Johnson 1986). The New World colonies occur at low elevations near the coast in freshwater or occasionally brackish habitats (Trinidad and Tobago) or in seasonal ponds (Brazil).

The question of how *M. minuta* became introduced into the Pensacola area deserves consideration. Johnson (1986) has reviewed the literature concerning long-distance dispersal of *Marsilea* sporocarps in the digestive tracts of migratory aquatic birds; and this mode of transport for certain species of *Marsilea*, particularly via various ducks (genus *Anas*, and possibly also *Aix*), is an established fact and a not uncommon occurrence. Dennis and Webb (1981) have commented on similar long-distance dispersal of *Pilularia* sporocarps by waterfowl. It thus seems apparent that the most probable mode of introduction of *M. minuta* into the Pensacola area is long-distance sporocarp transport via waterfowl from South America. This is particularly likely in view of the proximity of the discovery site to a waterfront area (Bayou Grande) visited by migratory waterfowl and the fact that a number of

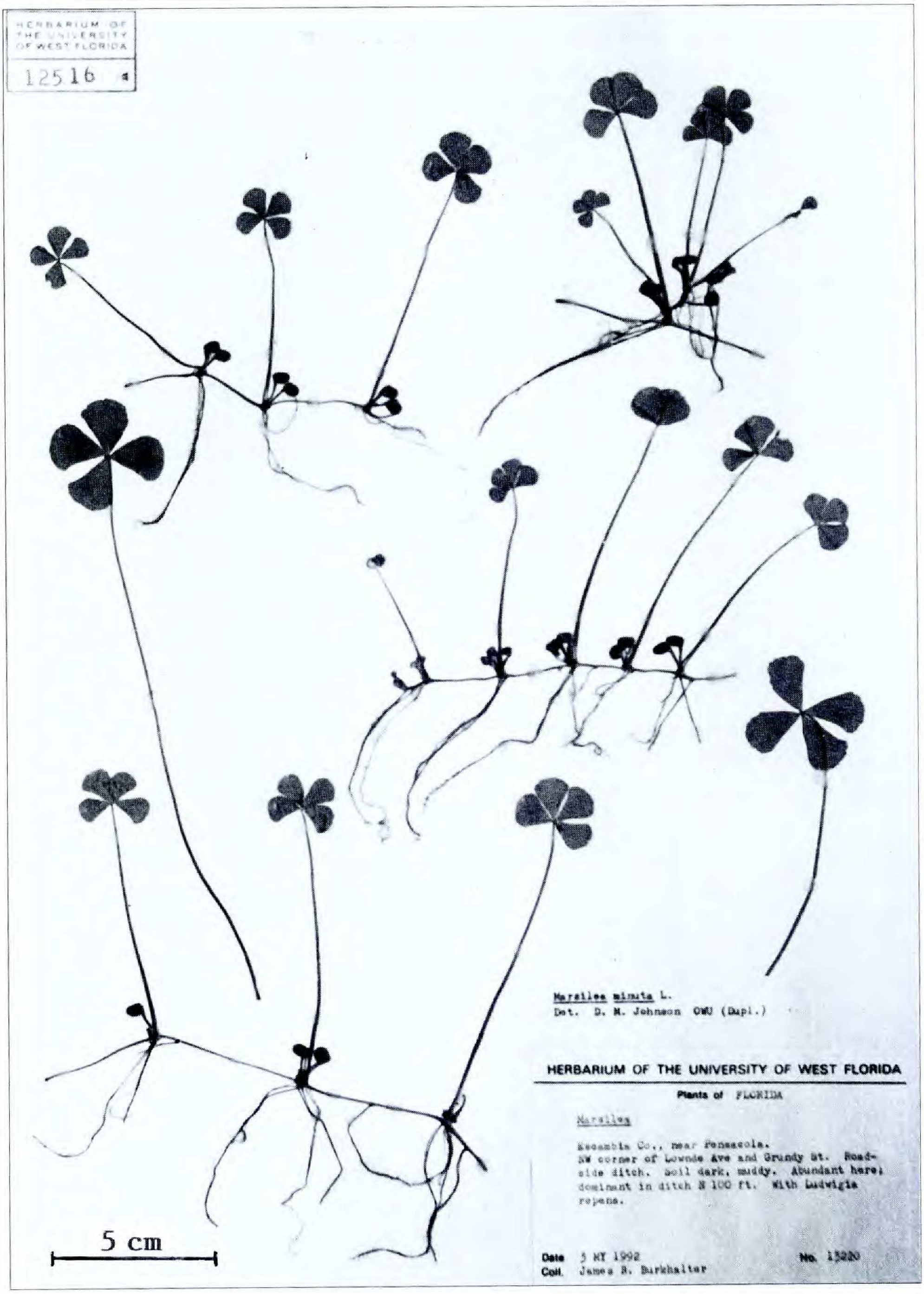

FIG. 1. Herbarium specimen of *Marsilea minuta* L. (*Burkhalter 13220*, UWFP).

migratory waterfowl species with suitable dietary habits (including species of *Anas* and *Porphyrula*) use flyways which pass over Pensacola and the known sites for *M. minuta* in Brazil, Trinidad, and Tobago (cf. Pough 1951, Weston 1965; Kale & Maehr 1990; Ffrench 1991). Of course, one bird transporting one sporocarp is all that would have been required to initiate the subject colony of *M. minuta* near Pensacola.

More than two years of observations have revealed that *Marsilea minuta* is evergreen in the Pensacola area and that it easily withstood two days of near- and below-freezing temperatures on 12–13 March 1993 and another unusually cold period on 17–18 January 1994. These facts, together with the documented invasive and weedy tendencies of this fern in other areas (Johnson 1986), lead to the conclusion that *M. minuta* indeed has the potential to become a weed of some importance throughout the southeastern United States. Suitable habitats for possible invasion by *M. minuta* include roadside ditches, sunny edges of freshwater and brackish marshes and swamp forests, and other similar low moist sites. Based on the luxuriant growth of *M. minuta* in the ditch at the discovery site, there is some concern that it would grow as vigorously if it became introduced into other similar sites. Fortunately, as of this writing, this interesting invader from South America is apparently restricted to the single streetside ditch where it was discovered.

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